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EXAMINER	
WILSON, MICHAEL H	
ART UNIT	PAPER NUMBER
1794	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/538,219	BOERNER, HERBERT FRIEDRICH	
	Examiner	Art Unit	
	MICHAEL WILSON	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 January 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9 and 12-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☒ Claim(s) *1-9 and 12-18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This Office action is in response to Applicant's amendment filed 15 January, 2009, which amends claims 5, 9, and 12.

Claims 1-9 and 12-18 are pending.

2. The rejection of under 35 U.S.C. 112, second paragraph of claims 5, 9, and 12-18, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention is withdrawn due to applicant's amending of the claims in the reply filed 15 January, 2009.

Claim Objections

3. Claim 12 is objected to under 37 CFR 1.75(c) as being in improper form because **it depends from itself**. See MPEP § 608.01(n). For the purpose of this Office action said claim has been treated as if depending from claim 1.

Appropriate correction is required.

4. Claim 9 is objected to because of the following informalities:

Claim 9, line 4 "wherein a lowest-energy triplet state" should read --wherein the lowest-energy triplet state--. As currently written the claim is confusing because it implies a compound has multiple LUMO's when there is only one *lowest* unoccupied molecular orbital (LUMO) in a compound.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Lamansky et al. (US 2002/0182441 A1) as evidenced by Thompson et al. (US 2003/0124381 A1).

Regarding claims 1 and 2, Lamansky et al. discloses an organic electroluminescent component having a layer composite comprising:

- a substrate layer [0097],
- a first transparent electrode layer [0097],
- a mixing layer (page 23, first entry of table II, and [0137]) having
    - a matrix of a conductive organic material with at least one singlet and triplet state ([0143] CBP) which is a p-conductive or n-conductive material (page 23, first entry of table II),
    - in this matrix, a light-emitting material comprise an metallo-organic complex compound with an emissive triplet state ([0046], page 23, first entry of table II), and
- a second electrode ([0097], LiF and Al bilayer),

- wherein the lowest-energy triplet state of the conductive organic material is higher than the emissive triplet state of the metallo-organic complex compound by an energy difference E_t with is greater than or equal to 2000 cm^{-1} (page 23 tables II first entry PtOEP in CBP, triplet energies in table I).

Regarding the limitations of the matrix material being a hole conducting material, CBP disclosed as a matrix material by Lamansky et al. is known to be a hole conducting material and inherently has the ability to conduct holes as evidenced by Thompson et al. [0064].

7. Claims 1-3, 6, 7, 9, 12, 13, 16, and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Ise et al. (US 2002/0028329 A1) and as evidenced by Holmes et al. (Blue organic electroluminescence using exothermic host-guest energy transfer.) and Thompson et al. (US 2003/0124381 A1).

Regarding claims 1 and 9, Ise et al. discloses an organic electroluminescent component having a layer composite comprising:

- a substrate layer [0180],
- a first transparent electrode layer ([0010] and [0172]),
- a mixing layer (light emitting layer [0009]) having
    - a matrix of a conductive organic material which is a p-conductive or n-conductive material ([0010]; page 15, compound A-10),
    - in this matrix, a light-emitting material comprise an metallo-organic complex compound with an emissive triplet state [0149], and

- a second electrode [0010],
- wherein the lowest-energy triplet state of the conductive organic material is higher than the emissive triplet state of the metallo-organic complex compound by an energy difference Et. ([00029] and [0010]).

Regarding the singlet states of the host compound, while Ise et al. do not explicitly disclose the existence of a singlet state for the host compounds the compounds disclosed by Ise et al. as host compounds are known to posses both singlet and triplet states. Specifically aryl amine compounds of the type such as compound A-10 (page 15) are known to inherently posses both types of states as evidenced by Holmes et al. (page 2423, column 1, lines 12-13, and page 2424, column 1, lines 15-17, note: fluorescent is emission from a singlet state).

Regarding the limitations of the matrix material being a hole conducting material, compound A-10 disclosed as a matrix material by Ise et al. is known to be a hole conducting material and inherently has the ability to conduct holes as evidenced by Thompson et al. [0064].

Regarding claims 2 and 12, Ise et al. discloses an organic electroluminescent device as set forth above. Additionally the reference discloses wherein the energy difference between the matrix and the light-emitting compound is E_t >= 2000 cm-1 ([0032]; [0195] table 1, examples 2, 4, and 8-10, note Ise et al. measure the T1 energy level of both host and light-emitting material in kcal/mol [0032]).

Regarding claims 3, 7, 13, and 17, Ise et al. discloses the device as set forth above. Additionally the reference discloses wherein the conductive organic material

comprises a structural element which is a benzene ring substituted with an organic substituent R, a carbazole group, in the meta position (page15, compound A-10).

Regarding claims 6 and 16, Ise et al. disclose an organic electroluminescent device as set forth above. Additionally the reference discloses wherein the conductive organic material is a conductive organic monomer (page 15, compound A-10) or polymer [0118].

8. Claims 1, 3-6, 9, and 13-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Adachi et al. (US 2002/0180347 A1) as evidenced by Holmes et al. (Blue organic electroluminescence using exothermic host-guest energy transfer.).

Regarding claims 1 and 9, Adachi et al. discloses an organic electroluminescent component having a layer composite comprising:

- a substrate layer [0027],
- a first transparent electrode layer [0032]-[0033],
- a mixing layer ([0020] and [0038]) having
    - a hole conducting matrix of a conductive organic material which is a p-conductive or n-conductive material ([0020] and [0038]),
    - in this matrix, a light-emitting material comprise an metallo-organic complex compound with an emissive triplet state ([0020] and [0038]),
- a second electrode [0032]-[0033].

Regarding the singlet and triplet states of the host compound, while Adachi et al. do not explicitly disclose the existence of singlet and triplet states for the host

compound, the compound disclosed by Adachi et al. is known to posses both singlet and triplet states. Additionally the host compound of Adachi et al. is within the genus disclosed by applicant as possessing both singlet and triplet states. Therefore the hole conducting host compound of Adachi et al. is considered to meet the present claim limitation.

Further regarding the triplet energy of the host compound, while Adachi does not disclose the energy of the triplet state the compound is within the formula disclosed by applicant as having a triplet energy higher than that of the light-emitting compound. Therefore since the compound disclosed by Adachi et al. being within the formula claimed by applicant, the triplet energy of the compound would be expected inherently to have the same properties as disclosed by applicant. Recitation of a newly disclosed property does not distinguish over a reference disclosure of the article or composition claims. *General Electric v. Jewe Incandescent Lamp Co.*, 67 USPQ 155. *Titanium Metal Corp. v. Banner*, 227 USPQ 773. Applicant bears responsibility for proving that reference composition does not possess the characteristics recited in the claims. In *re Fritzgerald*, 205 USPQ 597, In *re Best*, 195 USPQ 430.

Regarding claims 3, 13 and 14, Adachi et al. discloses the device as set forth above and characterized in that the conductive organic material comprises a structural element which is a benzene ring or biphenyl substituted with an organic substituent R in the meta position [0020].

Regarding claims 4, 5, and 15, Adachi et al. discloses the device as set forth above and characterized in that the conductive organic material comprises a structural element which is a biphenyl substituted in two meta positions [0020].

Regarding claims 6 and 16, Adachi et al. disclose an organic electroluminescent device as set forth above. Additionally the reference discloses wherein the conductive organic material is a conductive organic monomer [0020].

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. Claims 7 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adachi et al. (2002/0180347 A1) as applied to claim 1 above and in view of Maeda et al. (US 5,185,228).

Regarding claims 7 and 17, Adachi et al. disclose all the claim limitations as set forth above. Additionally the reference teaches aryl amine compounds are suitable for the host material in the emissive hole transporting layer Adachi et al. [0020] However the reference does not explicitly the triplet energy of the host compound or the host being a compound substituted by aryl amine groups in the meta position.

Maeda et al. teach an electrophotosensitive device (abstract). The reference teaches meta substituted benzene compounds with aryl amine substituents (column 4, line 65 to column 5, line 54) as a charge transfer compound. The meta substituted benzene is taught to transfer energy to a compound with a lower triplet energy. The reference teaches the compounds prevent a decrease is charge amount and sensitivity in the device (column 4, line 65 to column 5, line 2), which would result in an increase is device stability.

It would be obvious to one of ordinary skill in the art at the time of the invention to use the meta substituted benzene compounds of Maeda et al., which have multiple meta substituted aryl amine groups, as a host material in the emissive hole transporting layer of Adachi et al. One or ordinary skill in the art would reasonably expect such compounds to be suitable given Adachi et al. discloses aryl amine compounds as suitable and Maeda et al. teach the compounds to transfer energy to lower triplet energy levels of other compounds, which is a critical part of the process that enables the phosphorescent dopant in the layer to emit light. One of ordinary skill in the art would be motivated by a desire to improve the device stability.

Regarding the singlet and triplet energy of the meta substituted benzene compounds of Maeda et al. While the reference does not explicitly disclose the singlet and triplet energy of the compounds, the compounds are within the formula disclosed by applicant as possessing a singlet state and a triplet energy which would be greater than the triplet energy of the light-emitting compound. Therefore since the compounds disclosed by Maeda et al. being within the formula claimed by applicant, the singlet and triplet states of the compounds would be expected inherently to have the same properties as disclosed by applicant. Recitation of a newly disclosed property does not distinguish over a reference disclosure of the article or composition claims. *General Electric v. Jewe Incandescent Lamp Co.*, 67 USPQ 155. *Titanium Metal Corp. v. Banner*, 227 USPQ 773. Applicant bears responsibility for proving that reference composition does not possess the characteristics recited in the claims. In *re Fritzgerald*, 205 USPQ 597, In *re Best*, 195 USPQ 430.

12. Claims 5, 7, 8, 15, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adachi et al. (2002/0180347 A1) as applied to claim 1 above and in view of Shi et al. (2001/0023029 A1).

Regarding claims 5, 7, 8, 15, 17 and 18, Adachi et al. disclose all the claim limitations as set forth above. Additionally the reference teaches aryl amine compounds are suitable for the host material in the emissive hole transporting layer Adachi et al. [0020] However the reference does not explicitly the triplet energy of the host compound or the host being a compound substituted by phenyl and phenyl derivative groups in the meta position.

Shi et al. teach a similar organic electroluminescent device (abstract). The reference teaches substituent benzene and biphenyl compounds, bearing phenyl and phenyl derivative as substituents, as hole transporting compounds ([0044]; pages 5-10, compounds 9-15, 17-41, 43-46, and 49). The compounds are taught to prevent fluorescence quenching improving the luminous efficiency of the device [0009].

It would be obvious to one of ordinary skill in the art at the time of the invention to use the hole transporting compound of Shi et al. as the host material for the in the emissive hole transporting layer of Adachi et al. One of ordinary skill in the art would reasonably expect such a combination to be suitable given that Shi et al. teach the compounds as hole transporting compounds used inorganic electroluminescent devices. One of ordinary skill in the art would be motivated by a desire to improve the luminous efficiency of the device.

Regarding the singlet and triplet energy of the meta substituted benzene and biphenyl compounds of Shi et al. While the reference does not explicitly disclose the singlet and triplet energy of the compounds, the compounds are within the formula disclosed by applicant as possessing a singlet state and a triplet energy which would be greater than the triplet energy of the light-emitting compound. Therefore since the compounds disclosed by Shi et al. being within the formula claimed by applicant, the singlet and triplet states of the compounds would be expected inherently to have the same properties as disclosed by applicant. Recitation of a newly disclosed property does not distinguish over a reference disclosure of the article or composition claims. *General Electric v. Jewe Incandescent Lamp Co*., 67 USPQ 155. *Titanium Metal Corp.*

v. Banner, 227 USPQ 773. Applicant bears responsibility for proving that reference composition does not possess the characteristics recited in the claims. In *re Fritzgerald*, 205 USPQ 597, In *re Best*, 195 USPQ 430.

Response to Arguments

13. Applicant's arguments filed 15 January, 2009 have been fully considered but they are not persuasive.

Applicants argues that Lamansky et al. (US 2002/0182441 A1) fails to reveal the disclosure of a matrix of a hole conductive organic material as claimed, citing [0143], and that the Examiner asserts CBP is inherently a matrix turning to Thompson, et al. for support for this position. However, table II on page 23 of Lamansky et al. clearly demonstrates the host material CBP with a guest (or dopant) material which is a phosphorescent metallo-organic complex. Paragraph [0143] of Lamansky et al. demonstrates CBP possesses both singlet and triplet excited states. Thompson et al. (US 2003/0124381 A1) is used to establish that CBP is hole transporting. As a compounds ability to transport holes (hole mobility) is an inherent property of the compound, Thompson et al. clearly teaches CBP, among other compounds, to posses this property.

The examiner does not rely on Thompson et al. to teach that CBP is a “matrix.” The term “matrix” is not explicitly defined in the present specification, therefore the “plain meaning” of the term is used, MPEP 2111.01. The meaning of “matrix” most consistent with its usage in the art as well as in the present specification is “material in

which something is enclosed or embedded" (Merriam-Webster Online Dictionary definition 3b) as previously stated. Chen et al. (US 5,935,720) further support this position when discussing the two component light-emitting layer Alq/DCM Chen et al. describe Alq as host and DCM as dopant (column 2, lines 19-29) and further state "the EL efficiency of the guest-host system is highly dependent on the concentration of the guest *in the host matrix*" (emphasis added). Clearly Chen et al. recognizes the host in a host-guest system as the "matrix." Under this definition the host material is clearly the matrix with a phosphorescent guest compound embedded within.

Applicant also argues that while CBP in Thompson, et al. *may* be a hole conducting material, there is no teaching that it *must* be a hole conducting material. However the cited Thompson et al. section clearly teach CBP as a hole transporting material, and as a suitable hole transporting material for organic electroluminescent devices. Therefore the examiner has properly demonstrated CBP as a hole transporting compound supported by objective evidence and has not relied upon "personal knowledge." Applicant however has failed to present any evidence in rebuttal of this position.

Regarding rejections under Ise et al. (US 2002/0028329 A1), applicant argues that while the reference describes a light-emitting material, there is no disclosure of the matrix of a conductive organic material comprising a light-emitting material having a metallo-organic complex compound as specifically claimed. Applicant asserts that while the reference does describe a host material and a guest material, it does not describe a matrix as claimed. Moreover applicant argues the term 'matrix' does not appear in the

reference. The examiner agrees that Ise et al. does not use the term matrix. However the failure to use the same terms to describe composition does not change the basic nature of the composition. Given the plain meaning of matrix as earlier explained the host material of Ise et al. is clearly the claimed matrix. While asserting the difference between host and matrix material, applicant has failed to demonstrate any physical difference, or any difference whatsoever, between the two except the word chosen to describe the major component of a mixture.

Regarding Adachi et al. (US 2002/0180347 A1) applicant argues that the reference fails to disclose a hole conducting matrix of a conductive organic material. However the reference discloses in [0020] "the second HTL [hole transport layer], which is doped with a phosphorescent material…" Paragraph [0038] gives a specific device example of the second HTL doped with a phosphorescent dopant, clearly meeting the claim requirement of a hole conducting matrix of a conductive organic material.

Additionally, applicant notes that a proper rejection of a claim under 35 U.S.C. § 102 requires that a single prior art reference disclose each element of the claim. However it is well established references in addition to the single prior art reference may be used in order to establish the existence of an inherent property as explained in MPEP 2131.01. Continental Can Co. USA v. Monsanto Co., 948 F.2d 1264, 1268, 20 USPQ2d 1746, 1749 (Fed. Cir. 1991) (The court went on to explain that "this modest flexibility in the rule that anticipation' requires that every element of the claims appear in a single reference accommodates situations in which the common knowledge of technologists is not recorded in the reference; that is, where technological facts are

known to those in the field of the invention, albeit not known to judges." 948 F.2d at 1268, 20 USPQ at 1749-50.). Note that as long as there is evidence of record establishing inherency, failure of those skilled in the art to contemporaneously recognize an inherent property, function or ingredient of a prior art reference does not preclude a finding of anticipation. See also Atlas Powder Co. v. IRECO, Inc., 190 F.3d 1342, 1349, 51 USPQ2d 1943, 1948 (Fed. Cir. 1999); In re King, 801 F.2d 1324, 1327, 231 USPQ 136, 139 (Fed. Cir. 1986); Titanium Metals Corp. v. Banner, 778 F.2d 775, 782, 227 USPQ 773, 778 (Fed. Cir. 1985). See MPEP § 2112 - § 2112.02 for case law on inherency. Also note that the critical date of extrinsic evidence showing a universal fact need not antedate the filing date. See MPEP § 2124.

Conclusion

14. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL WILSON whose telephone number is (571) 270-3882. The examiner can normally be reached on Monday-Thursday, 7:30-5:00PM EST, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Callie Shosho can be reached on (571) 272-1123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

16. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MHW

/Callie E. Shosho/
Supervisory Patent Examiner, Art Unit 1794